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ESTIMATE OF PLANNING SURVEY EXPENDITURES

FOR PERIOD BEGINNING NOVEMBER 1, 1958

AND ENDING DECEMBER 31, 1959

MONTANA STATE HIGHWAY COMMISSION

IN COOPERATION WITH

U. S. DEPARTMENT OF COMMERCE

BUREAU OF PUBLIC ROADS

Submitted October 20, 1958

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MONTANA STATE HIGHWAY COMMISSION
PLANNING SURVEY DIVISION
HELENA, MONTANA

October 20, 1958

MEMORANDUM

To: Fred Quinnell, Jr., State Highway Engineer

FROM: Howard T. Buswell, Planning Survey Manager

Submitted herewith is an estimate of the proposed activities and expenditures of the Planning Survey Division for the period beginning November 1, 1958 and ending December 31, 1959.

This estimate will obligate a total of $705,044 in State and Federal highway planning funds. This amount is equal to about 80% of the total money programmed under HPS - 1 (20) to cover highway planning funds under the apportionment of Federal Aid for the fiscal year ending June 30, 1959. The remaining unobligated portion of HPS - 1 (20) will be retained in reserve status to cover any unforeseen contingencies, and if it is not obligated by June 30, 1959 for planning purposes, it will then be released for construction activities.

The greater part of this new work program consists of continuing activities in the mapping, traffic counting, and statistical compilation fields. These activities are fundamental and essential adjuncts to the entire highway planning program, and they have been a part of the Planning Survey work program since 1936.

New activities of interest include the following:

Statewide county line traffic classification
Appraisal of the economic impact of new highways
Forest highway needs study
Computation of flow from drainage areas
Testing of Soil Conservation Service samples
New railroad hazard ratings
Financing from planning funds of new weigh stations
New Interstate System needs estimate
Program for keeping needs estimate up to date
Comparison of traffic forecasts with actual developments.

The following is a statement of the funds involved in this work program and the proportion of Federal and State money required:

PROJECT HPS - 1 (20)
(FY 1959 Federal Aid Planning Funds)

FEDERAL AID SYSTEM	FEDERAL FUNDS AMOUNT	FEDERAL FUNDS PERCENT	STATE FUNDS AMOUNT	STATE FUNDS PERCENT	TOTAL AMOUNT
Primary	$ 94,284	56.49	$ 72,620	43.41	$166,904
Secondary	65,024	56.49	50,084	43.41	115,108
Urban	5,960	56.49	4,591	43.41	10,551
Interstate	376,595	91.30	35,886	8.70	412,481
TOTAL	$541,863	76.86	$163,181	23.14	$705.044

TOTAL FEDERAL FUND AVAILABLE UNDER HPS - 1 (20)	$677,168
LESS: FEDERAL FUNDS IN THIS WORK PROGRAM	-541,863
RESERVE FEDERAL FUNDS UNDER HPS - 1 (20)	$135,305

It may be noted that 77% of this work program will be paid out of Federal funds, the remaining 23% will be paid out of State funds.

Your approval of this estimate is requested.

H. T. Buswell

H. T. Buswell
Planning Survey Manager

MONTANA STATE HIGHWAY COMMISSION
PLANNING SURVEY DIVISION
In Cooperation with
U. S. BUREAU OF PUBLIC ROADS

October 20, 1958

ESTIMATE OF ACTIVITIES AND EXPENDITURES FOR THE PERIOD BEGINNING NOVERMBER 1, 1958 AND ENDING DECEMBER 31, 1959

1. ROAD INVENTORY - REGULAR

In order to keep a current record of construction on roads other than State highways, other road building agencies are contacted each year to determine the extent and location of construction work performed by them. This work will be continued on the regular basis during the period of this estimate.

ESTIMATED EXPENDITURES $ 500

2. ROAD INVENTORY AND FIELD CHECKING OF MAPS

When new base maps are prepared from aerial photography or other source material, it is necessary that the maps be reviewed in the field to determine the accuracy of the data shown thereon and also to record dwellings, structures and other features. At the same time, a record is made of roadway and structure dimensions for inventory purposes.

During the past year, inventory was completed in Carbon, Lincoln and Sanders counties. It is expected that Beaverhead County will be completed this fall. Flathead is the only county which has not been inventoried under the first revision of the 1936 maps, and it is planned to cover this county next summer. Because of the extensive development in Missoula and Yellowstone counties, it is planned that these counties will also be re-inventoried during the period of this estimate.

ESTIMATED EXPENDITURES $ 25,000

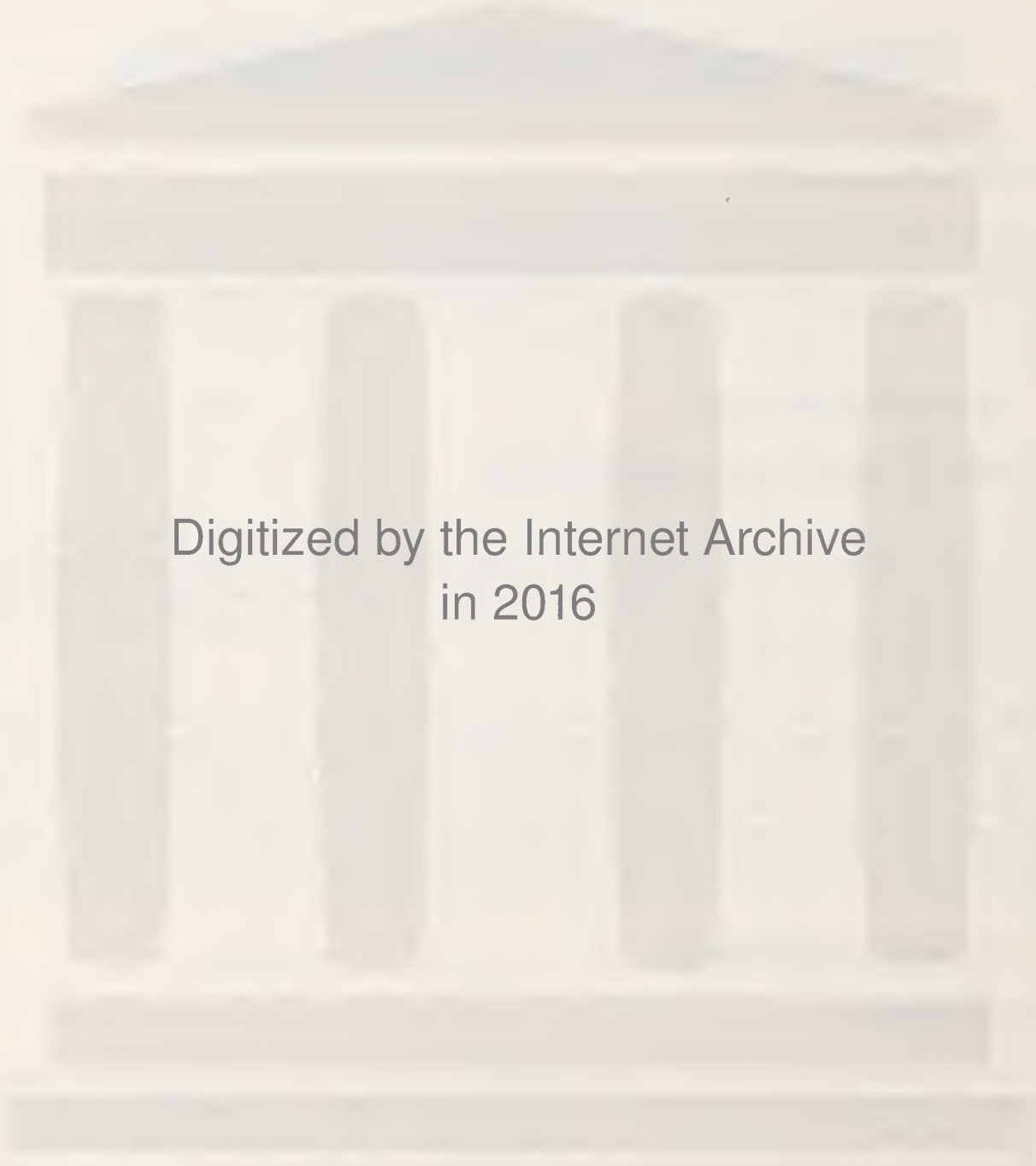
3. BRIDGE INVENTORY

This in a continuing project involving the inspection of bridges on the State highway system for the purpose of recording condition, needed repairs and other data. One-half of the State is covered each year, and the western half of the State will be included in the period of this estimate.

ESTIMATED EXPENDITURES $ 5,000

4. SUFFICIENCY RATINGS

The State law requires that State construction funds for the Primary System be divided among 12 financial districts on the basis of the deficient highway mileage in each district. Deficiency is determined on the basis of geometrics


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and physical condition applying to each project. Through the application of a traffic factor, the deficiency ratings are converted to a priority rating for programming purposes. Work on this project will continue on a normal basis.

ESTIMATED EXPENDITURES $ 5,000

5. TRUCK AND BUS INVENTORY

Since the Registrar of Motor Vehicles does not maintain statistical records concerning motor vehicles in the detail required for the MVR Report, it is necessary that the required data be extracted from registration records by the Planning Survey Division. The information is also used for other purposes beyond the scope of the MVR Report, but in the field of registration statistics.

ESTIMATED EXPENDITURES $ 10,000

6. COUNTY MAPS - AERIAL

In the continuing program of revising the original county base maps, new maps are prepared for a few counties per year on the basis of aerial photography, U. S. G. S. maps, and other material which is current. It is expected that new maps will be prepared for those counties which were inventoried this year; namely Beaverhead, Carbon, Lincoln and Sanders counties.

There appears to be a demand for a small book of sectional county maps which can be transported and filed easily. It is proposed that the present $\frac{1}{2}$" sectional maps be reduced to the $8\frac{1}{2}$ x 11" size, or $\frac{1}{4}$" scale, and bound in a booklet similar to the city plat book.

ESTIMATED EXPENDITURES $ 30,000

7. COUNTY MAPS - OTHER

This category includes any minor revisions to existing maps which involve relocations, construction changes, correction of previous errors and other transactions not covered in the general map revision.

ESTIMATED EXPENDITURES $ 1,000

8. STATE MAPS

The Planning Survey Division is charged with the responsibility for keeping the State highway map in current status and verifying the accuracy of data shown thereon, including roadway mileages between points.

This category also includes expenditures in connection with the large scale State map.

ESTIMATED EXPENDITURES $ 2,000

9. STRAIGHT LINE DIAGRAMS

Pertinent data from the construction plans are recorded each year in the Straight Line Diagrams. This record, which is a substitute for the RL-7 Form of the Road Life records, provides a convenient reference for construction data which could otherwise be obtained only from an inspection of the construction plans. The diagrams are prepared for all Federal Aid systems.

ESTIMATED EXPENDITURES $ 10,000

10. CITY PLATS

The Planning Survey Division prepares a series of city plats in the size of 8½" x 11" and 17" x 22". Each year the cities are requested to report any changes in boundaries, additions, street openings and closures, or other features so that the plats may be kept current.

Since the State law provides that State-printed material may not be distributed to the public, we have been unable to comply with the substantial demand for the sale of these books. In order to correct this situation, the new books have been printed by a commercial firm, so we expect to sell a large quantity of these books.

ESTIMATED EXPENDITURES $ 8,000

11. MISCELLANEOUS MAPPING

This category includes a small amount of money to cover contingency mapping not included in the other items.

ESTIMATED EXPENDITURES $ 500

12. AUTOMATIC COUNTERS

This project includes the cost of installation and maintenance of the automatic traffic counters located at strategic points throughout the State. At present, twenty-six of these counters are in operation. As new highways are opened to traffic, it will be desirable to install automatic counters to record the traffic movement. The Grassrange -Malta highway should be open to traffic in the coming year, and it is planned to install a new counter on this highway. Many of the counters are an old type which are becoming costly to maintain, and it will be necessary to replace a few of these during the period of this budget.

ESTIMATED EXPENDITURES $ 20,000

13. PORTABLE COUNTERS

Portable counters are used at points of lesser importance where a continous record is not required. Many of these counters are of a type which was designed and built by State forces. They are gradually deteriorating and are being replaced by a commercial product. Also, as the Secondary System expands, it becomes necessary to purchase additional counters to obtain the necessary traffic

counts on the new routes. The amount shown below includes the cost of purchasing additional counters and maintaining the present counters.

ESTIMATED EXPENDITURES $ 20,000

14. TRAFFIC COUNTS REGULAR

During the past few years, we have had three employees who enter the field in February and travel over a specified itenerary, counting and Classifying traffic on State highways and county roads until the weather forces suspension of activities during December. The addition of new Secondary System routes and the expansion of other traffic counts have increased the workload to the point that three employees can no longer cover all points. It is planned that the size of this force will be increased to four employees.

The results of these counts are recorded in an annual Traffic By Section Report. Traffic flow maps are also prepared for the Primary and Secondary Systems. Other counts are recorded on special maps for office reference.

The regular traffic counting program covers only the rural portions of the State highways. There have been no counts in cities since 1955, and it is considered advisable to obtain coverage of this type during 1959.

It has been the practice to obtain blanket counts of a few counties each year, but this operation was suspended during the last three years in favor of more pressing work in connection with the 1956 and 1958 Acts. If personnel and equipment are available, these counts will be renewed during the period of this estimate.

It has been suggested that a detailed record be kept of the factors involved in traffic forecasts for projects, routes or other sections of highway so that the forecasts may be compared with actual future developments in order to determine where the forecasting technique could be improved. A plan for this procedure has been developed and these records will be kept as a continuing process.

ESTIMATED EXPENDITURES $ 75,000

15. TRAFFIC MAPS

This category includes the cost of preparing traffic flow maps and other special traffic maps.

ESTIMATED EXPENDITURES $ 1,000

16. SPEED STUDIES

This is a continuing project wherein speeds are recorded by radar on selected sections of highway in order to determine the trend from year to year. The results are published in a brief annual report.

ESTIMATED EXPENDITURES $ 3,000

17. SPECIAL TRAFFIC STUDIES

This category is reserved for special traffic studies which are not provided

for in the regular traffic operations. At this time, there are no major studies planned, but past experience has shown that the need for several special studies arises as conditions develop during the year.

Many years ago, classification counts were made at county lines on the principal highways throughout the State. During these counts, an employee classified the vehicles by type and also recorded the county as identified by the license prefix. Although the method was not as accurate as the regular origin-destination study, it did provide a picture of Statewide traffic movements and desire lines. It also provided a means of separating the local intercounty traffic from the Statewide traffic.

Because of time limitations, the original survey was limited to a single two-hour count at each station. It is believed that such a short count was not fully representative of true conditions. It is planned to renew this survey during the coming summer months and to expand the operations in scope, frequency and duration of counts.

ESTIMATED EXPENDITURES $ 20,000

18. ECONOMIC IMPACT STUDIES

During the past year, a very extensive study has been made of the tourist industry in the State. The Planning Survey Division conducted a number of roadside interviews in order to obtain a general picture of the amount of tourist traffic and the movements. Personnel of Montana State University conducted a series of detailed interviews at places of lodging in order to obtain additional and more precise information concerning expenditures, routings chosen, places of interest and other items of importance. A final report on the findings of the entire survey will be prepared by the University personnel and released sometime in the month of December 1958.

In conjunction with the Tourist Survey, statistics were also collected for the Transcontinental Origin-Destination Study as requested by the BPR.

The results of this survey should be effective for several years, so there would be little advantage in repeating the survey each year.

As a replacement economic impact study, it is proposed to analyze the traffic movements on newly opened highways in order to determine the relationship between the cost of the new highway and the amount of money saved by the traffic as the result of the new and shortened route. The survey will also involve an analysis of the extent and nature of diversion from other highways and the rate at which traffic builds up on newly opened highways.

The Grassrange -Malta highway should provide an excellent basis for the original survey. Upon completion of the Missouri River bridge in December 1958, this highway should be open for travel, although a substantial portion of the highway will not have an oiled surface. It will be interesting to note the extent to which traffic will use the new highway because of distance savings involved, even though it will involve travel on considerable mileage of unpaved road. It will also be interesting to note the amount of increase in travel

when the entire highway is completed to oiled standards.

In order to be most effective, such a survey should be continued for a number of years until traffic movements have stabilized. Other highways which might be analyzed include the following: Bonner-Lincoln-Sun River, Hardin-Custer, Circle-Sidney, Van Norman-Fort Peck, Skalkaho Pass, Wisdom-Idaho Line, Lolo Pass, Swan River and others which will produce a significant change in travel patterns.

The estimated cost, as shown below, includes a moderate allowance for completion of the Tourist Survey.

ESTIMATED EXPENDITURES $ 20,000

19. FOREST HIGHWAY NEEDS STUDY

The Federal Aid Highway Act of 1958 provided for a study of the cost of improving present and potential forest highways to the desired standards. Work has started on this project, but the costs will carry into the first half of the period of this estimate. This has been approved as a Planning Survey project with Federal Aid participation in the costs of aerial photography, field estimates of construction costs, IBM coding and tabulation, and other items necessary to complete this project.

ESTIMATED EXPENDITURES $ 75,000

20. DRAINAGE AREA FLOW

For about three years, the State has participated in the cost of a survey designed to produce data concerning the magnitude and frequency of floods from minor drainage areas. The results are used in the selection of size and the design of culverts and small bridges. The field work and computation of results have been performed by the Water Resources Branch of the U. S. Geological Survey. This agency has also financed one-half of the cost of the project.

To date, this survey has been restricted to a small number of sites in the eastern, plains area of the State because of the limited finances available. It is desired to increase operations to include mountainous and hilly areas in the eastern part of the State and also selected locations in the western half of the State. The number of sites will be increased from the present 16 to a tenative total of 75 sites distributed over the State. It is reported that the program should be carried for a minimum of 6 years in order to obtain reliable data.

Since this project involves advance highway planning, it is considered to be eligible as a Planning Survey project. The U. S. Geological Survey will continue to serve as contracting agency for the installation and maintenance of the necessary gauges and the compilation of the required data; however, it will not participate in the cost of the project.

The detailed prospectus of this project is on file in the Planning Survey Division.

ESTIMATED EXPENDITURES $ 16,000

21. SOIL TESTING

The Bureau of Public Roads and the Soil Conservation Service have been engaged since 1951 in a joint soils analysis program. Soil survey maps and reports have been prepared which have assisted in highway reconnaissance and location, planning of detailed soil surveys, and the location of aggregate materials. The analysis of the soils samples has been performed by the Washington laboratory of the BPR, but the number of samples has increased to a point that exceeds the capacity of that facility. It has been suggested by the BPR that the samples be analyzed in the State laboratories with the cost being financed out of highway planning funds. Such an arrangement will provide the State laboratories with direct and immediate knowledge of the sampling programs and the results of the analyses.

ESTIMATED EXPENDITURES $ 4,000

22. RAILROAD HAZARD RATINGS

In about 1941, the Planning Survey Division prepared a report analyzing the hazard ratings at various railroad grade crossings throught the State. These ratings are used in highway programming and design. The original ratings have lost much of their value because of changing conditions. During the coming year, it is proposed that a new hazard rating study be made to present current conditions.

ESTIMATED EXPENDITURES $ 5,000

23. LOADOMETER SURVEY

For a number of years, the Planning Survey Division has conducted a survey of the characteristics of trucks and trailers operating on the highways of the State. This survey is intended to collect statistical information concerning these vehicles which is used in long range planning and in highway design. Annual reports of vehicle characteristics are prepared and a comparison is made of the trend from year to year. This is a continuing study.

It has recently been decided that highway planning funds may be used to finance the cost of scale houses, scales, and other equipment necessary for weighing and measuring vehicles at those stations on the Federal Aid systems which are required and used for statistical and research purposes. An allowance is included in this estimate for these facilities at the following stations which are expected to be included during the period of this estimate: Helena-North, Shelby-North, Crow Agency, Vaughn.

ESTIMATED EXPENDITURES $ 90,000

24. FISCAL STUDIES - STATE

The Planning Survey Division prepares numerous reports concerning State motor vehicle registrations, tax collections, highway finances and other items which are used by the BPR in national summaries. These data are also used at the State level for highway planning, legislative proposals and numberous other

purposes. The operations will continue in the same manner as in previous years.

ESTIMATED EXPENDITURES $ 3,000

25. FISCAL STUDIES - LOCAL

Analyses are also made of the receipts and expenditures of the cities and counties for road, street and allied functions. The results are summarized in annual reports and are used in national summaries. This work will also continue in the normal manner.

ESTIMATED EXPENDITURES $ 2,000

26. ROAD LIFE, ROAD LOG AND SM TABLES

These are a series of interrelated functions which maintain a constant and historical record of the various construction contracts and maintenance projects as they affect the State highway systems. The principal product of these studies is the annual Federal Aid Road Log which presents a complete record of the current status of each project on each route of the Federal Aid systems. Projects are classified according to age, geometrics, length, and location with respect to counties, national forest, Indian reservations and other features. Road Life records present an historical picture of highway development since early days and also contain a record of the money spent on each section.

Work on these projects will continue in the normal manner; however, the increasing number of projects contracted produces a corresponding increase in the amount of money spent in this category for recording the data pertaining to these contracts.

ESTIMATED EXPENDITURES $ 30,000

27. ECONOMIC HIGHWAY STUDIES

In instances where highway locations cannot be determined conclusively on the basis of visual inspection, or in instances where controversies exist, the Planning Survey Division is requested to make economic analyses of the various routings. These analyses compare the construction and maintenance costs for the alternate routes with the corresponding operating costs for the traffic which would use the routes. The route having the lowest composite cost would ordinarily be recommended, provided that other factors did not outweigh the cost differential.

Most attention is devoted to analyses of the Interstate System, but this category also includes an allowance for Primary System studies and the cost of compiling data for Secondary System route proposals.

ESTIMATED EXPENDITURES $ 10,000

28. FEDERAL AID HIGHWAY ACT STUDIES

The Federal Aid Highway Acts of 1956 and 1958 both provide that certain investigations be made of matters pertaining to highways. Most of these studies come within the province of highway planning and the cost becomes a Planning Survey obligation. The majority of the known studies have been completed within the period of the last work program, but it may be expected that new studies will be recommended within the period of this estimate. Since these studies generally involve considerable effort, a substantial allowance is included to cover the cost of these items.

ESTIMATED EXPENDITURES $ 60,000

29. INTERSTATE SYSTEM NEEDS STUDY

A needs study of this type, as required under Section 108(d) of the 1956 Act, has been furnished to congress and was used as the basis for apportioning Federal Aid Interstate funds for fiscal years 1960 and 1961. New legislation provides that a revised estimate be sumitted to Congress by January 1961. The procedures for this later estimate have not been prescribed, but it may be expected that considerable money and effort will be expended, and allowance is being made for this contingency.

ESTIMATED EXPENDITURES $ 100,000

30. CONSTRUCTION STATISTICS

Over a period of years, the Planning Survey Division has compiled considerable data concerning highway construction contracts. This work has become of such importance that it is assigned a separate category. Operations include a price index determination, computation of unit bid prices, analysis of cost per mile for various cost items, expenditures by system and county, and expenditures per vehicle-mile of traffic.

It has been suggested that the Planning Survey Division keep current the estimate of needs made under Section 108(d) and Section 210 of the 1956 Act. Work in this connection will be included under this category.

ESTIMATED EXPENDITURES $ 10,000

31. ACCIDENT STUDY

Under this project, the Highway Patrol reports are analyzed and data are extracted concerning the type of accident, location of highway section, estimate of cost, and relationship to the volume of traffic. An annual report is prepared which summarizes these data and pinpoints the sections where the accident rate is critical. The accuracy of the report will improve in relation to the number of accidents which are analyzed. This is a continuing study.

ESTIMATED EXPENDITURES $ 5,000

32. HIGHWAY HISTORY

A start was made a few years ago towards the preparation of Volume II of the Highway History. This project has been deferred in preference to projects with higher priority ratings. There has also been difficulty in obtaining a qualified person to prepare this report who has had sufficient experience with the department to become acquainted with the historical background and who also has a talent for writing. In the meantime, data are being collected in preparation of the ultimate completion of this report.

ESTIMATED EXPENDITURES $ 2,000

33. PUBLIC HEARINGS

This category includes the cost of compiling data and the preparation of exhibits which are necessary in connection with public hearings as required under Federal legislation.

ESTIMATED EXPENDITURES $ 2,000

34. UNDISTRIBUTED OVERHEAD

This category includes numberous items such as telephone service, stenographic employees, subscription to research publications, office supplies and other items which cannot be charged to some specific project. It also includes the time of the Planning Survey Manager which is spent in general supervision.

ESTIMATED EXPENDITURES $ 35,044

SUMMARY

ITEM	DESCRIPTION	AMOUNT
1.	Road Inventory - Regular	$ 500
2.	Road Inventory & Field Checking of Maps	25,000
3.	Bridge Inventory	5,000
4.	Sufficiency Ratings	5,000
5.	Truck & Bus Inventory	10,000
6.	County Maps - Aerial	30,000
7.	County Maps - Other	1,000
8.	State Maps	2,000
9.	Straight Line Diagrams	10,000
10.	City Plats	8,000
11.	Miscellaneous Mapping	500
12.	Automatic Counters - Installation & Repair	20,000
13.	Portable Counters - Installation & Repair	20,000
14.	Traffic Counts - Regular	75,000
15.	Traffic Maps	1,000
16.	Speed Studies	3,000
17.	Special Traffic Studies	20,000
18.	Economic Impact Studies	20,000
19.	Forest Highway Needs Study	75,000
20.	Drainage Area Flow	16,000
21.	Soil Testing	4,000
22.	Railroad Hazard Ratings	5,000
23.	Loadometer Survey	90,000
24.	Fiscal Studies - State	3,000
25.	Fiscal Studies - Local	2,000
26.	Road Life, Road Log and SM Tables	30,000
27.	Economic Highway Studies	10,000
28.	Federal Aid Highway Act Studies	60,000
29.	Interstate System Needs Study	100,000
30.	Construction Statistics	10,000
31.	Accident Study	5,000
32.	Highway History	2,000
33.	Public Hearings	2,000
34.	Undistributed Overhead	35,044
	TOTAL ESTIMATED EXPENDITURES FROM NOVEMBER 1, 1958 AND ENDING DECEMBER 31, 1959	$ 705,044

APPROVED: _____
Fred Quinnell, Jr.
State Highway Engineer

SUBMITTED: _____
H. T. Buswell
Planning Survey Manager

RECOMMENDED
FOR APPROVAL: _____
Richard M. Arenz
Highway Engineer
Bureau of Public Roads